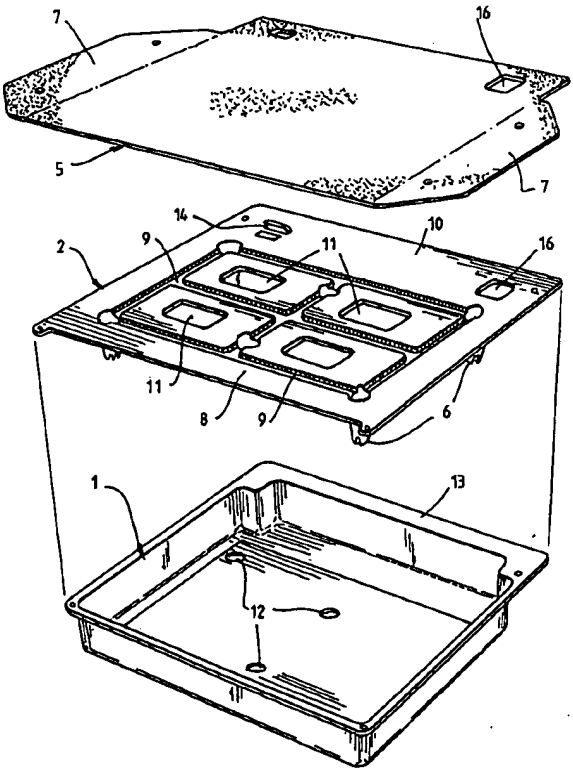




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(21) International Application Number: PCT/AU99/00953 (22) International Filing Date: 1 November 1999 (01.11.99) (30) Priority Data: PP 6902 2 November 1998 (02.11.98) AU (71) Applicant (for all designated States except US): REZITECH PTY. LTD. [AU/AU]; 1027 Mountain Highway, Bayswater, Victoria 3153 (AU). (72) Inventor; and (75) Inventor/Applicant (for US only): HAYNES, Eric [GB/AU]; 1027 Mountain Highway, Bayswater, Victoria 3153 (AU). (74) Agent: CARTER SMITH & BEADLE; Qantas House, 2 Railway Parade, P.O. Box 557, Camberwell, Victoria 3124 (AU).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.
(54) Title: IMPROVED POT PLANT WATERING SYSTEM (57) Abstract A pot plant watering system including a water reservoir (1) for holding a supply of water (4), an elevated platform (2) adapted to suspend one or a plurality of pots away from said water and a wick mat (5) adapted to draw water from said reservoir over the substantial surface of said platform so as to allow the pot to be placed on said platform and draw water from said wick wherein said water reservoir is substantially screened from direct light. 		

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IMPROVED POT PLANT WATERING SYSTEM

INTRODUCTION TO INVENTION

This invention relates to the domestic and commercial controlled watering of potted plants and in particular to a system adapted to passively control the watering of potted plants in a manner that minimises labour and produces highly reliable and cost effective results.

BACKGROUND OF INVENTION

Self-watering pots for plants have been available in various forms for a considerable period of time. Such self-watering pots rely on dedicated structural features of the pot to ensure a delivery of water from an integral reservoir to the plant. An example of such a pot is given in Australian Patent Application No. 67586/94. Pots of this type and their predecessors require particular design and manufacture of the pot and are not able to be used in conjunction with standard pots.

A self watering alternative to the above devices takes the form of a capillary wick able to draw water from a reservoir to "feed" a pot with water in a controlled manner. Examples of such devices are shown in Australian Patent Application No. 12311/95 and Australian Patent No. 630069. These prior art devices must rely on very particular wick insertion into the pots and often dedicated pot design to work effectively and cannot always be used with conventional pots.

An additional problem often encountered with self watering pots is the build up of algae in the water reservoir which is not desirable.

One object of the invention is to provide an improved self-watering pot system able to supply a controlled amount of water to a standard pot.

STATEMENT OF INVENTION

Accordingly, in one aspect the invention provides a pot plant watering system including a water reservoir for holding a supply of water, an elevated platform adapted to suspend one or a plurality of pots away from said water and a wick mat adapted to draw water from said reservoir over the substantial surface of said platform so as to allow the pot to be placed on said platform and draw water

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from said wick wherein said water reservoir is substantially screened from direct light.

The wick may be a continuous sheet of water permeable material adapted to draw water in a capillary action.

5 The platform may be adapted to sit in said reservoir and may be sized and dimensioned to substantially prevent direct light from reaching said water.

The platform may be suspended on a plurality of legs which are adapted to assist in said capillary action to draw water from said reservoir to said wick.

The reservoir may be provided with a water level gauge.

10 The system may also include a planter box for positioning around said reservoir to disguise the reservoir, platform and said wick mat.

The invention will now be described in detail with reference to a particularly preferred embodiment.

15 Figure 1 shows a top perspective view of the watering system with a pot plant in phantom..

Figure 2 shows an exploded view of the watering system from above.

Figure 3 shows an exploded view of the watering system from below.

Figure 4 shows a plan view of the platform from below.

Figure 5 shows a side view of the platform and wick mat fitted.

20 Figures 6 and 7 show front and side cross section views of the watering system.

Figure 8 shows a perspective view of a tower embodiment of the watering system.

Figure 9 shows a side view of the tower system.

25 Figure 10 shows a plan view of the tower system.

DETAILED DESCRIPTION OF INVENTION

Referring firstly to Figure 1, a particularly preferred embodiment of the invention is shown where the assembled watering system is shown with a pot plant
30 drawn in phantom. The watering system can be seen to comprise an unobtrusive slim line piece of apparatus that is readily incorporated into any existing nursery

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and home gardening systems. Referring now to Figures 2 and 3 the watering system is shown as an exploded view from the top and bottom and can be seen to include a small number of components beginning with an open tray or a reservoir 1 for holding a water supply 4. The reservoir can be any shape or form but is preferably a shallow type tray into which can be placed a platform 2 supported above the bottom of the reservoir by legs 6 so as to provide a flat surface suspended above the top water layer. The platform has a flat base 8 onto which one or a selection of pots can be placed. In order to provide a water supply to the pots placed on said platform, the system is provided with a wick mat 5 in the form of a water absorbent sheet of matting which is adapted for placement over the top of the base 8 of the platform 2 and capable of being wrapped underneath or draped over the edge of the base so that when the platform is placed in the reservoir 1, the edges 7 of the wick mat drape into the water 4 of the reservoir. By capillary action, the water is then drawn up into the wick mat so as to provide a conduit for the water supply to the base of the pot 3.

In this manner the combination of the wick and reservoir provide a constant and controlled rate of water supply to the pots. The dimensions of the platform base 8 are suitably configured to allow the base to substantially cover the open reservoir so as to limit the ingress of light to the reservoir thereby minimising the development of algae in the reservoir.

Details of the configuration and structure of the platform 2 are shown where the platform comprises a substantially flat base 8 supported on a plurality of legs 6. The legs 6 themselves are hollow in configuration and able to contribute to the capillary action for movement of the water to the wick mat. The particular configuration of the legs is more clearly detailed in Figures 6 and 7. A series of channels and conduits 9 on the surface of the platform assist in the even distribution of water as it migrates up to the wick mat 5. Intermediate of the channels or conduits are positioned apertures 11. The apertures ensure that the bottom of the pots does not become waterlogged in the unlikely event that excessive water migrates up the mat allowing water to return to the reservoir.

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Referring now to Figures 4 and 5 a plan underside view of the platform 2 is shown juxtaposed to a side view of the assembled system. The positioning of the legs 6 can be seen in relation to the side view of the reservoir detailed in Figure 5. The flat base 8 has an extended lip region 10 particularly adapted to ensure that the whole of the reservoir 1 is covered so as to minimise any light entering the reservoir and contributing to the development of algae etc. The formation of the channels or conduits 9 adds to the rigidity and strength of the platform 2 which assists in the controlled balancing of pots on the top thereof.

Referring now to Figure 6 a cross section view of the watering system is shown from the front or rear where the reservoir 1 can be seen to incorporate indentations 12 in the bottom thereof adapted for snugly receiving the legs 6 of the platform 2. The wick mat 5 is drawn tightly over the base 8 of the platform 2 and drawn over the edges where it can be fitted to the platform by drawing over protrudences 13. The edges of the wick mat 7 are then allowed to drape into the water 4.

Referring now to Figure 7 a cross section view of the watering system taken from the side shows the ability of the extended lip region of the platform 10 to clearly and thoroughly overlap the edge 13 of the reservoir. The shaping of the platform will most preferably substantially cover the whole of the open part of the reservoir so as to eliminate any unnecessary light ingress into the water thereby minimising any algae build up and protecting the reservoir against unnecessary water evaporation. In addition, the platform 2 can be provided with a water level gauge 14 comprising a pivotally mounted arm with a float 15 at one end and a visual component at the other end adapted for movement in and out of a suitably placed aperture on the base 8 such that when the water level gets below a certain level, the float sinks down and the visual indicator is caused to protrude through the aperture thereby providing a clear visual indication of the water level.

Referring now to Figures 8, 9 and 10 an alternative embodiment of the invention is shown where the watering system comprises a plurality of units of the type previously described stacked together in vertical array such that each water reservoir 1 is adapted for receiving four platforms 2 which each platform fitted

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with a wick mat 5 in the manner previously described. Each of the platform bases 8 is configured to cover substantially the exposed surface of the reservoir 1 to prevent or minimise the ingress of light into the water supply thereby minimising algae and often undesirable build ups. In all other respects the invention performs
5 in an analogous manner to that previously described for the single unit embodiment.

In use the watering system of the invention would be provided in a ready to use fashion with a platform 2 positioned in the reservoir 1 with the wick mat 5 drawn over the platform 2 of the base 8 and draped over the sides so as to provide
10 edges 7 adapted for co-operating with water placed in the reservoir. The reservoir is filled by placing water through the aperture 16 until a suitable water level is reached which is shown by the water level indicator 14 which moves in response to the water level in the reservoir. Once a suitable water level is reached the water will then automatically migrate up the wick mat by capillary action to cover the
15 surface of the platform and pot plants can then be placed on the watering system for receiving a steady and reliable water supply.

In a particularly preferred aspect of the invention, the watering system can incorporate a planter device or other decorative treatments where the watering system can be surrounded by a decorative planter in order to conceal the
20 components of the system and also, where necessary, to conceal the pot per se so as to provide and enhance the aesthetic for the plant which is comfortably housed in the planter and provided with very adequate watering mechanisms by way of the system of the invention which are substantially kept from view.

The invention provides for the first time a comprehensive, passive, totally
25 reliable and highly economical plant watering system which provides a number of advantages including extra growth of up to 20% over conventional watering methods, minimum water use with up to 95% of water supply actually used by the plant compared to conventional watering; the system provides quick propagation of plants, more even growth, no run off or pollution and minimises water stress
30 and transplant shock. The watering provided by the system can be precisely controlled and plant driven, that is the plant will only take the water required under

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any given situation and is not under risk of root saturation or water logging. The system of the invention also minimises potting mix compaction which results in far better root growth and less disease due to the top layer of potting mix remaining dry in contrast to conventional water systems that require the water to
5 be delivered from the top of the plant. This of course reduces fungus, mildew and other moisture causing problems. In addition, the watering system of the invention lowers the requirement for fertiliser due to less leaching and reduces leaf damage which often occurs with top watering where many plants, including African Violets, suffer damage when water comes into contact with the leaves. The
10 frequency of watering and the system of the invention is reduced by up to 80%. The particularly preferred embodiment of the invention provides a ready packaged and retainable product and does not involve complex watering channel or pot mechanisms and is easily accessible and simple to water with a conventional hose. In addition, the whole system of the invention is a fraction of the weight of
15 terracotta pots and lighter than conventional self watering plastic pots of the same dimensions

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Claims

1. A pot plant watering system including an open water reservoir for holding a supply of water, an elevated platform adapted to suspend one or a plurality of pots away from said water and a wick mat adapted to draw water from said
5 reservoir over the substantial surface of said platform so as to allow said pot to be placed on said platform and draw water from said wick where in said water reservoir opening is substantially screened from direct light.
2. A watering system according to claim 1 wherein said wick mat is a continuous sheet of water permeable material adapted to draw water in a capillary
10 action.
3. A watering system according to claim 1 or 2 wherein said platform is adapted to sit in said reservoir and is sized and dimensioned to cover said reservoir opening to screen direct light from said reservoir.
4. A watering system according to any one of claims 1 to 3 wherein said
15 platform includes a plurality of legs adapted for elevating said platform wherein said legs are hollow and provide a channel of communication between said water reservoir and said wick mat.
5. A watering system according to any one of claims 1 to 4 wherein said system is provided with a water level gauge comprising a pivoted float and a
20 visual indicator adapted to co-operate with said float to move from a first visible position at a low water level to a second visible position at a high water level.
6. A watering system according to claim 5 wherein said second visible position is less visible than said first visible position.
7. A watering system according to any one of claims 1 to 6 substantially as
25 hereinbefore described with reference to the examples.

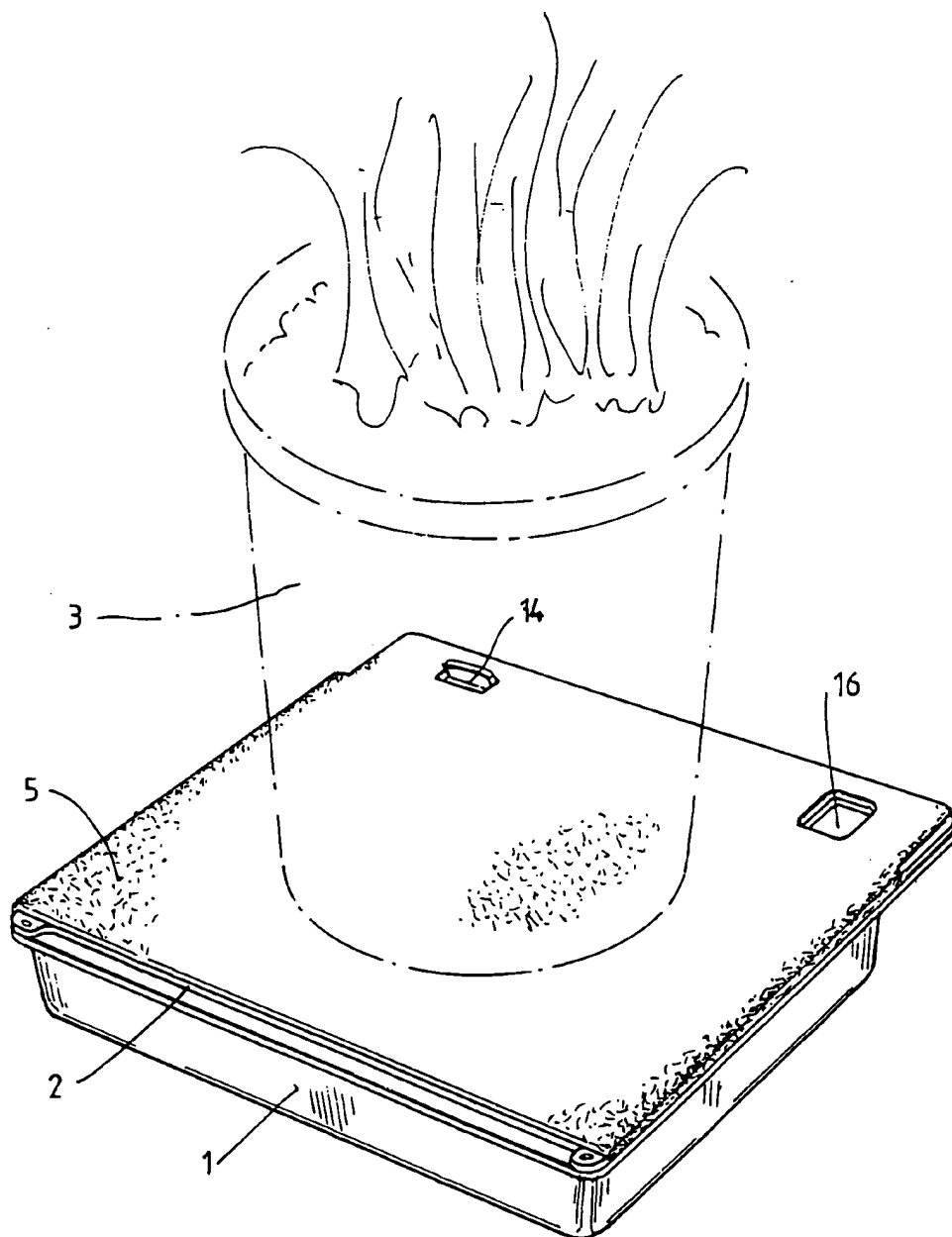


Fig. 1.

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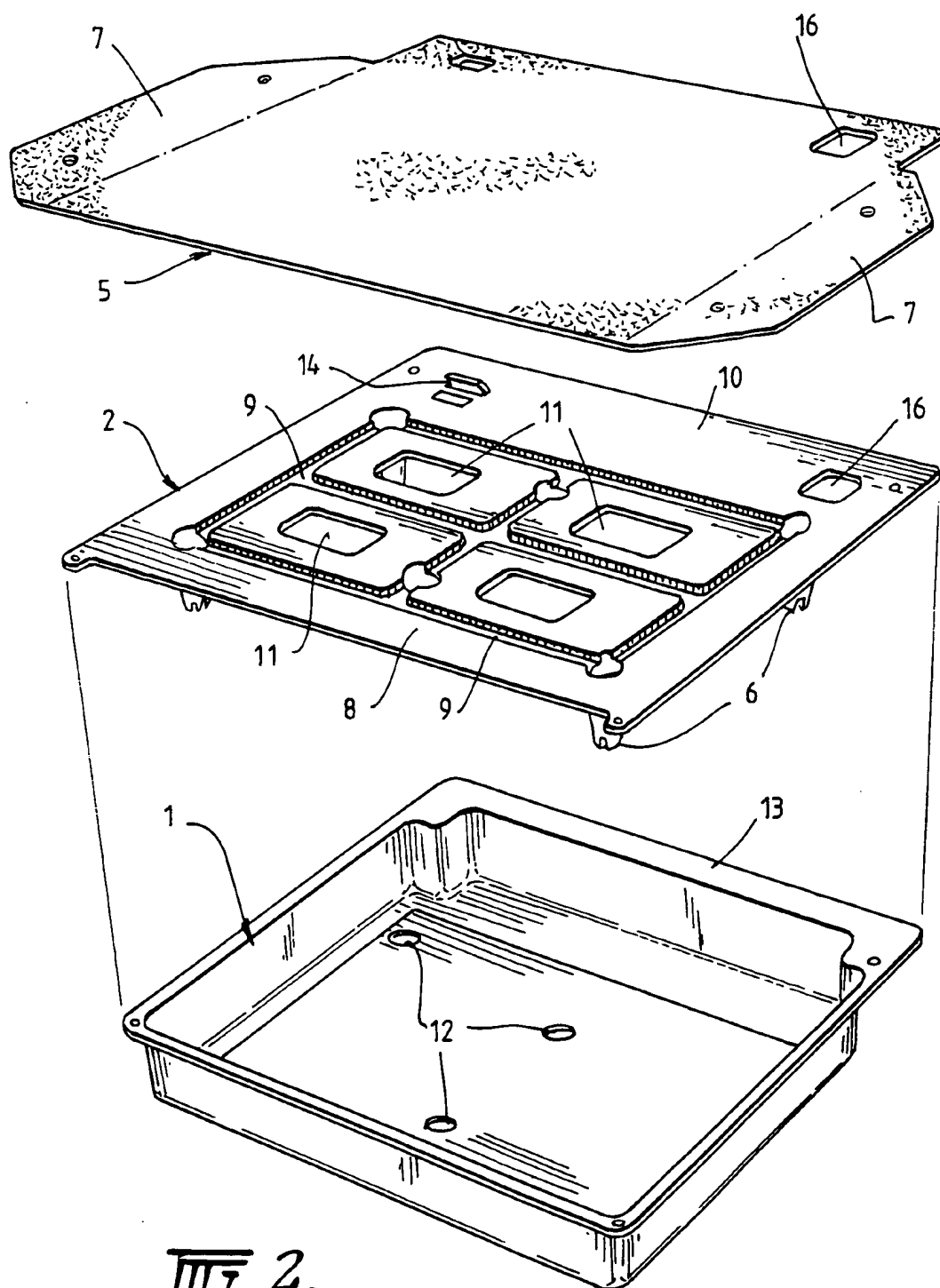


FIG. 2.

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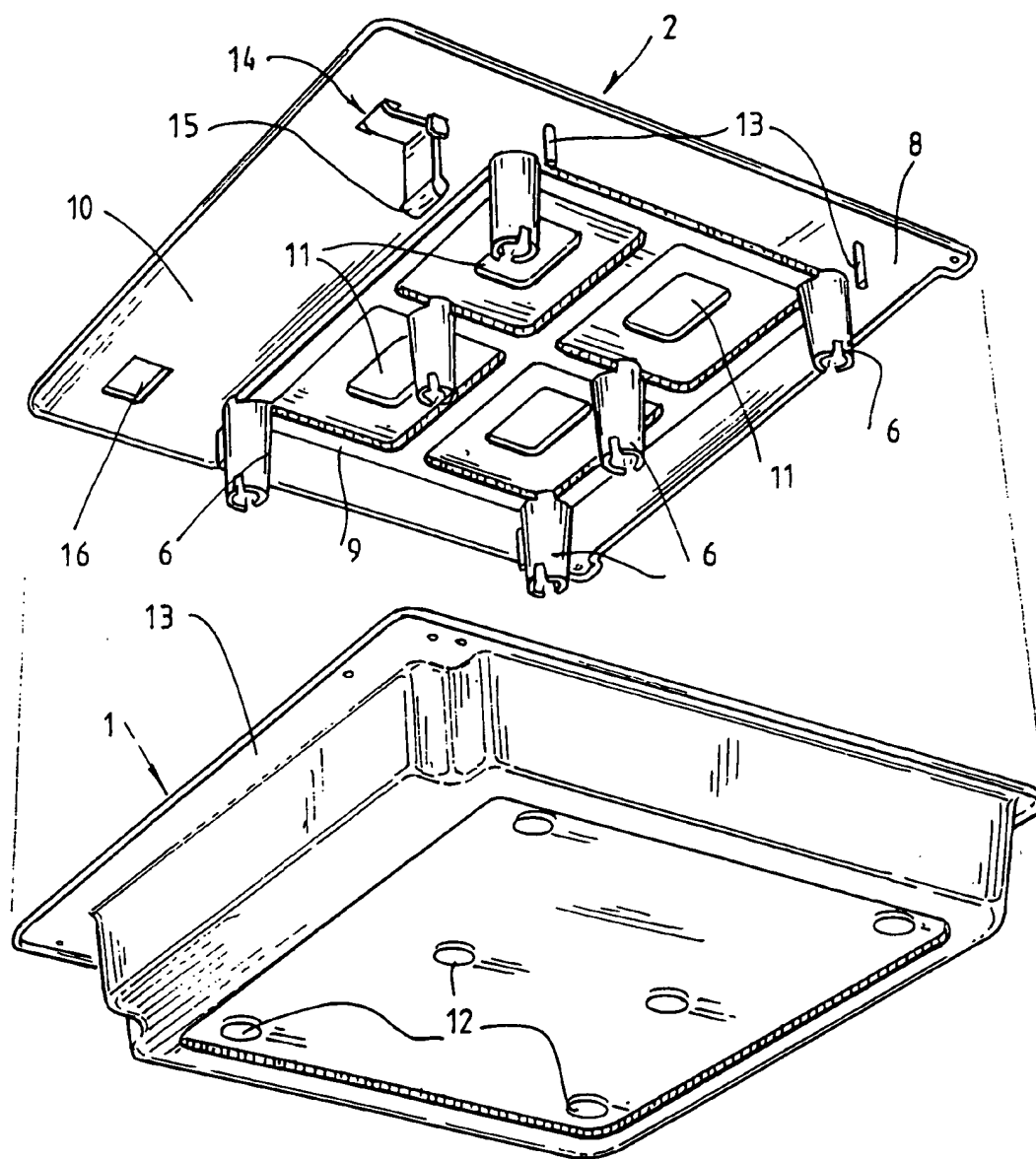
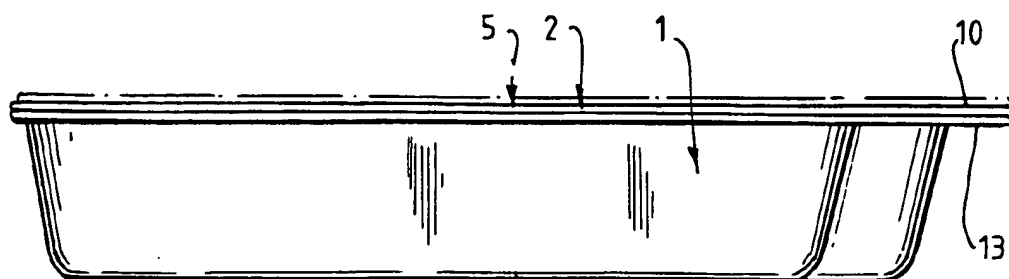
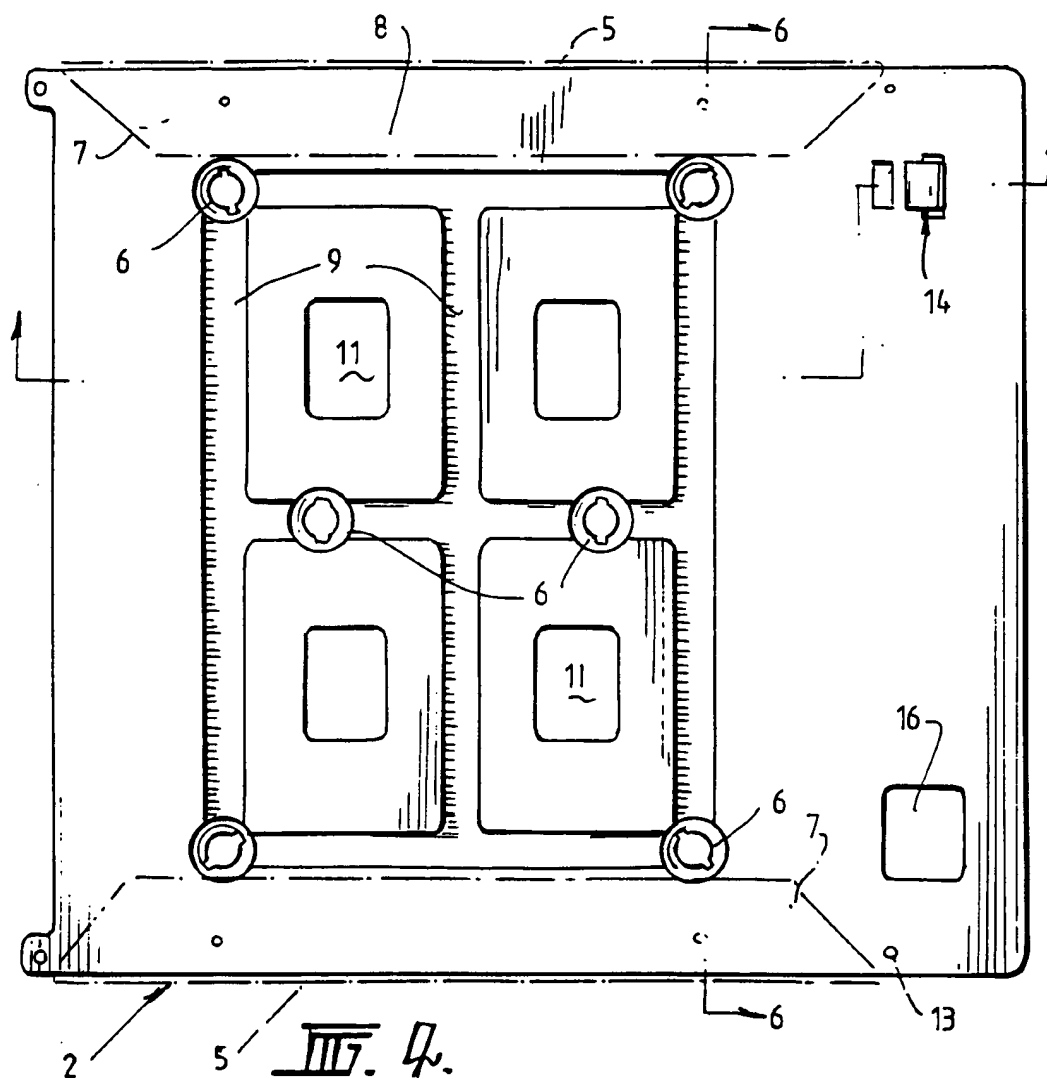


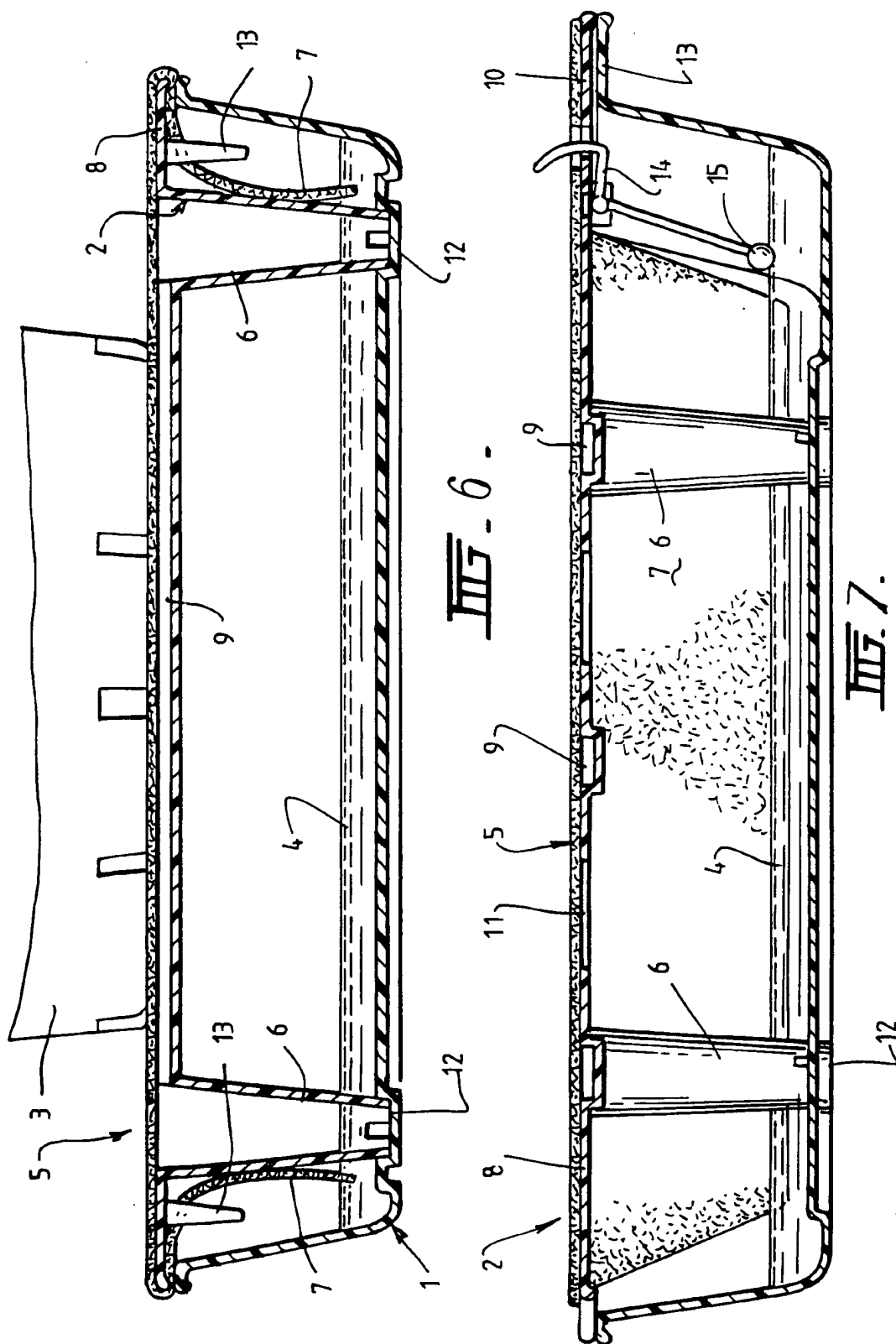
FIG. 3.

Substitute Sheet
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III. 5.

**Substitute Sheet
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Substitute Sheet
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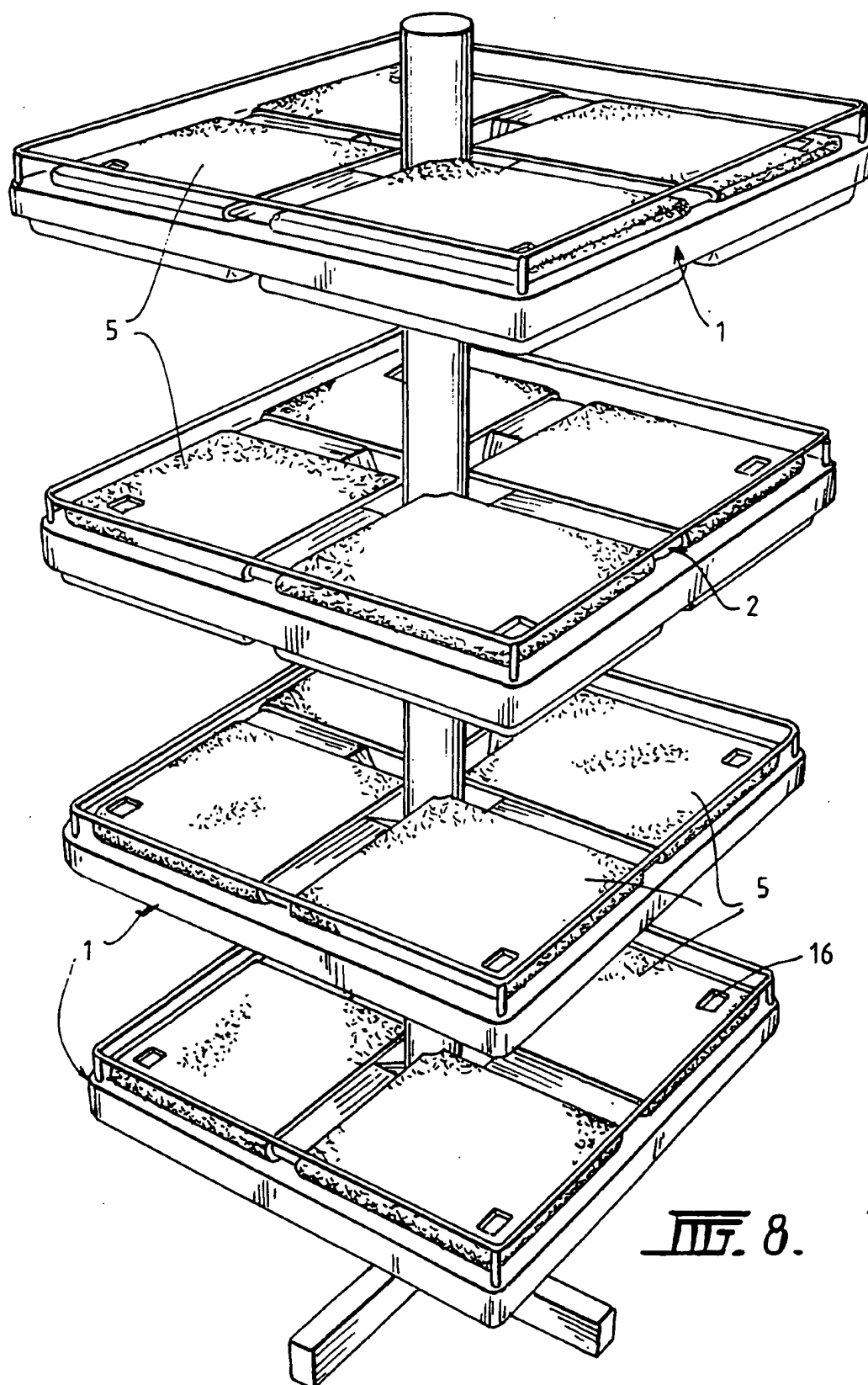


FIG. 8.

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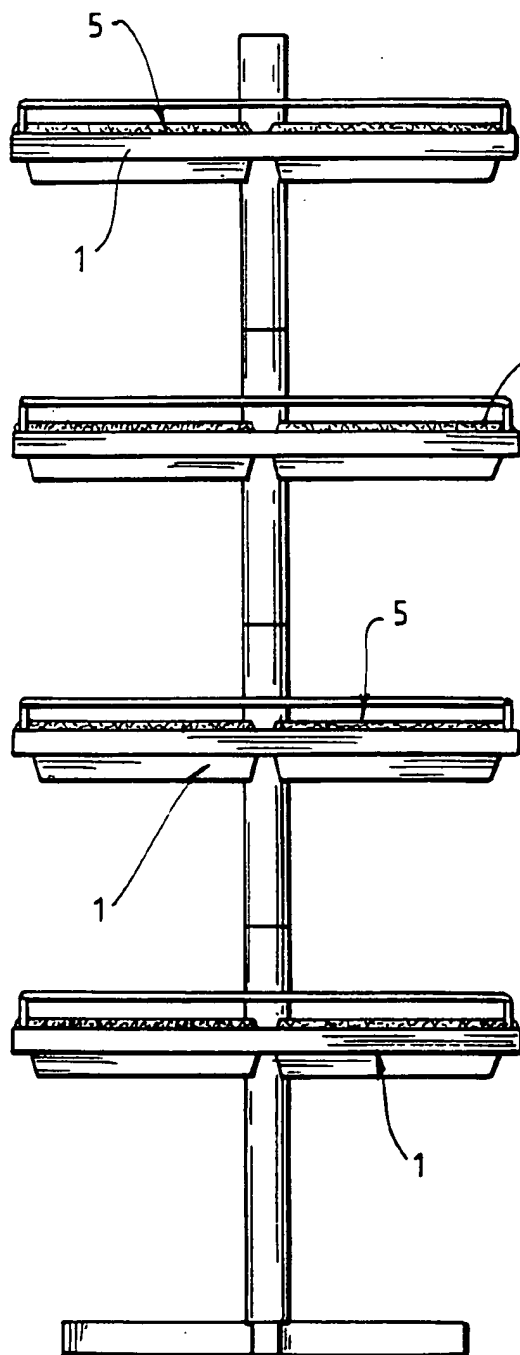


FIG. 9.

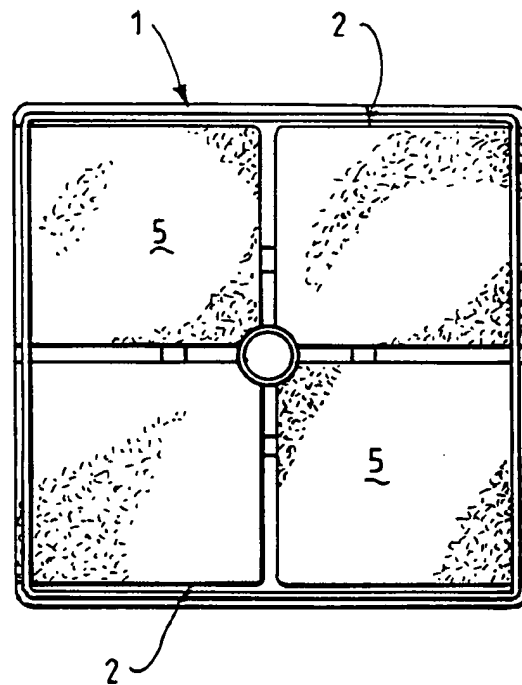


FIG. 10.

INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER																						
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According to International Patent Classification (IPC) or to both national classification and IPC																						
B. FIELDS SEARCHED																						
Minimum documentation searched (classification system followed by classification symbols) IPC A01G 27/00, 27/04																						
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC AS ABOVE																						
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPAT: Keywords																						
C. DOCUMENTS CONSIDERED TO BE RELEVANT																						
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																				
X	GB 2281182 A (TAYLOR) 1 March 1995 Page 1 last paragraph and page 2, claim 1 and figures 1 to 3	1-7																				
X	US 4428151 A (SOLOMON) 31 January 1984 Column 1 line 16 to column 4 line 2, claims 7 and 12 and figures 1 to 4	1-7																				
X	US 4276720 A (LYON) 7 July 1981 Column 1 line 41 to column 4 line 6, claim 4 and figures 1 to 3	1-7																				
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input type="checkbox"/> See patent family annex																						
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A"</td> <td>document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T"</td> <td>later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E"</td> <td>earlier application or patent but published on or after the international filing date</td> <td>"X"</td> <td>document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L"</td> <td>document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y"</td> <td>document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O"</td> <td>document referring to an oral disclosure, use, exhibition or other means</td> <td>"&"</td> <td>document member of the same patent family</td> </tr> <tr> <td>"P"</td> <td>document published prior to the international filing date but later than the priority date claimed</td> <td></td> <td></td> </tr> </table>			"A"	document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family	"P"	document published prior to the international filing date but later than the priority date claimed		
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Date of the actual completion of the international search 12 November 1999		Date of mailing of the international search report 15 DEC 1999																				
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No.: (02) 6285 3929		Authorized officer LIONEL BOPAGE Telephone No.: (02) 6283 2153																				

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU 99/00953

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4807394 A (LYON) 28 February 1989 Column 1 line 18 to column 3 line 3, Claims 1 & 7, Figures 1 to 4	1-7
X	GB 2018117 A (MARRISON) 23 March 1978 Whole document	1-7